ALTITUDE OPENED VALVE ASSEMBLY

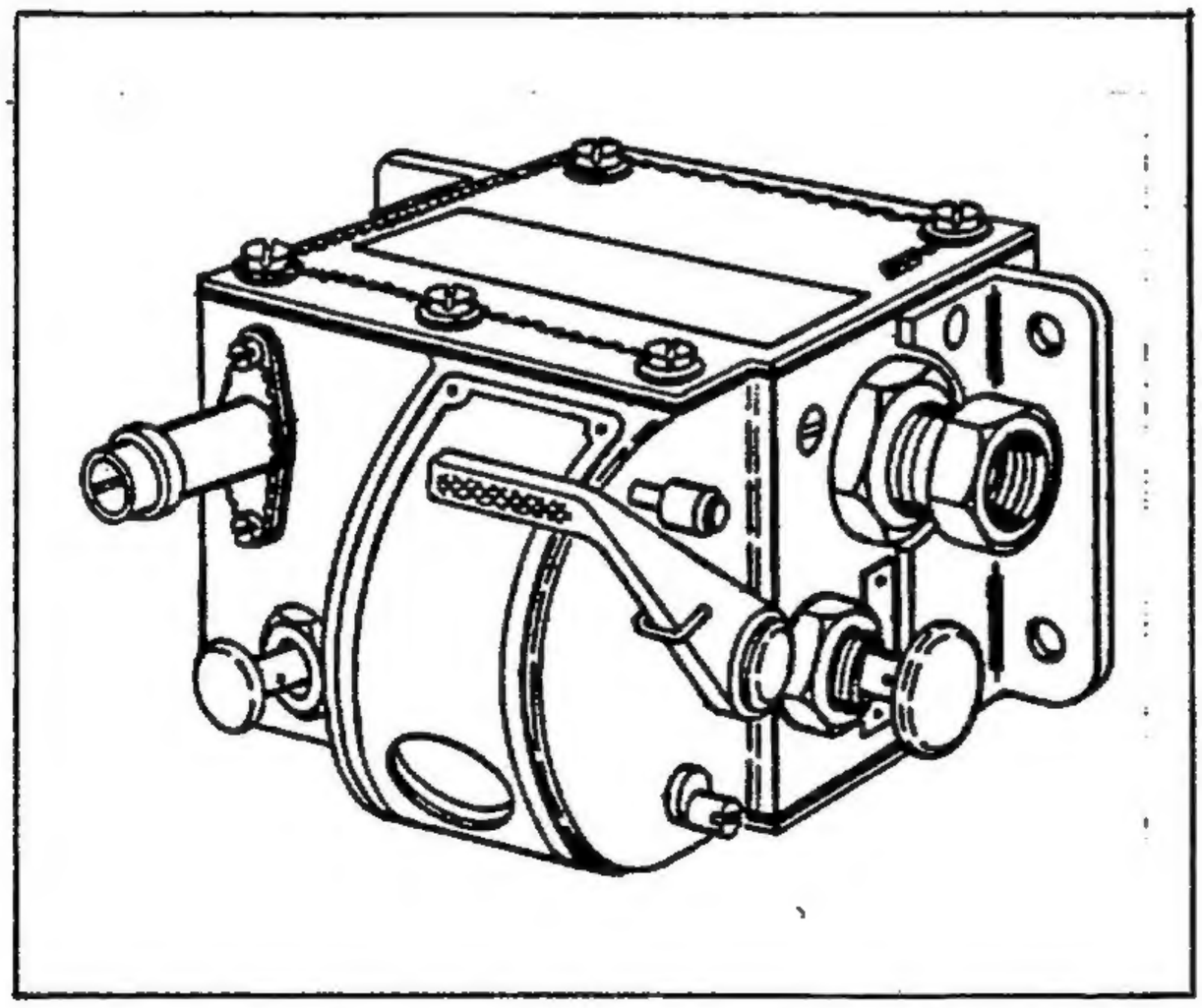
1. General

   A. This manual provides overhaul instructions with illustrated parts list for Altitude Opened Valve Assemblies, part number 10350-3, -5, and -7. (See figure 1.)

2. Description and Operation

   A. Purpose of Equipment

      (1) The altitude opened valve assembly is an aneroid/manually controlled slow opening oxygen turn on valve. It is part of the aircraft emergency oxygen system and, when installed in a pressurized cabin, provides automatic turn on of the oxygen in the event of cabin decompression. The valve assembly may also be manually activated.

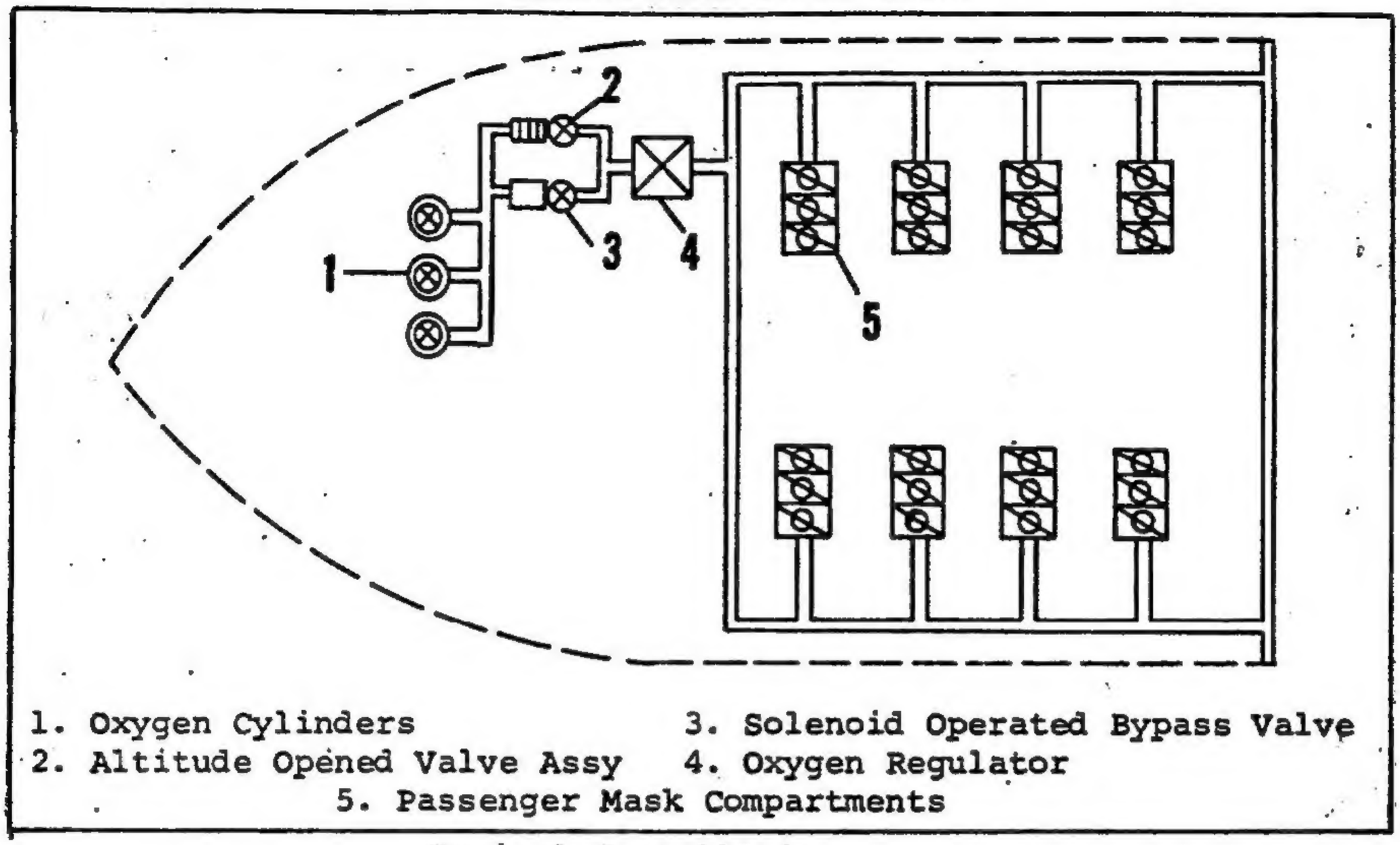


Altitude Opened Valve Assembly

Figure 1

   B. Typical Installation

      (1) A typical pressurized cabin installation of the altitude opened valve assembly is shown in Figure 2. An oxygen source consisting of a series of high pressure oxygen storage cylinders (1) is connected to the inlet of altitude opened valve assembly (2) and a solenoid operated oxygen bypass



1. Oxygen Cylinders
2. Altitude Opened Valve Assy
3. Solenoid Operated Bypass Valve
4. Oxygen Regulator
5. Passenger Mask Compartments

Typical Installation
Figure 2

valve (3), through an oxygen regulator (4), to the passenger mask compartments (5).

(2) Valves (2 and 3) are normally closed. The aneroid within altitude opened valve (2) is preset to automatically open in the event of cabin decompression, thereby allowing oxygen to flow through regulator (4) to passenger mask compartments (5). If required, solenoid operated oxygen bypass valve (3), installed in parallel with valve (2), may be opened electrically by a crew member from the cockpit of the aircraft, to supply oxygen to passenger mask compartments (5).

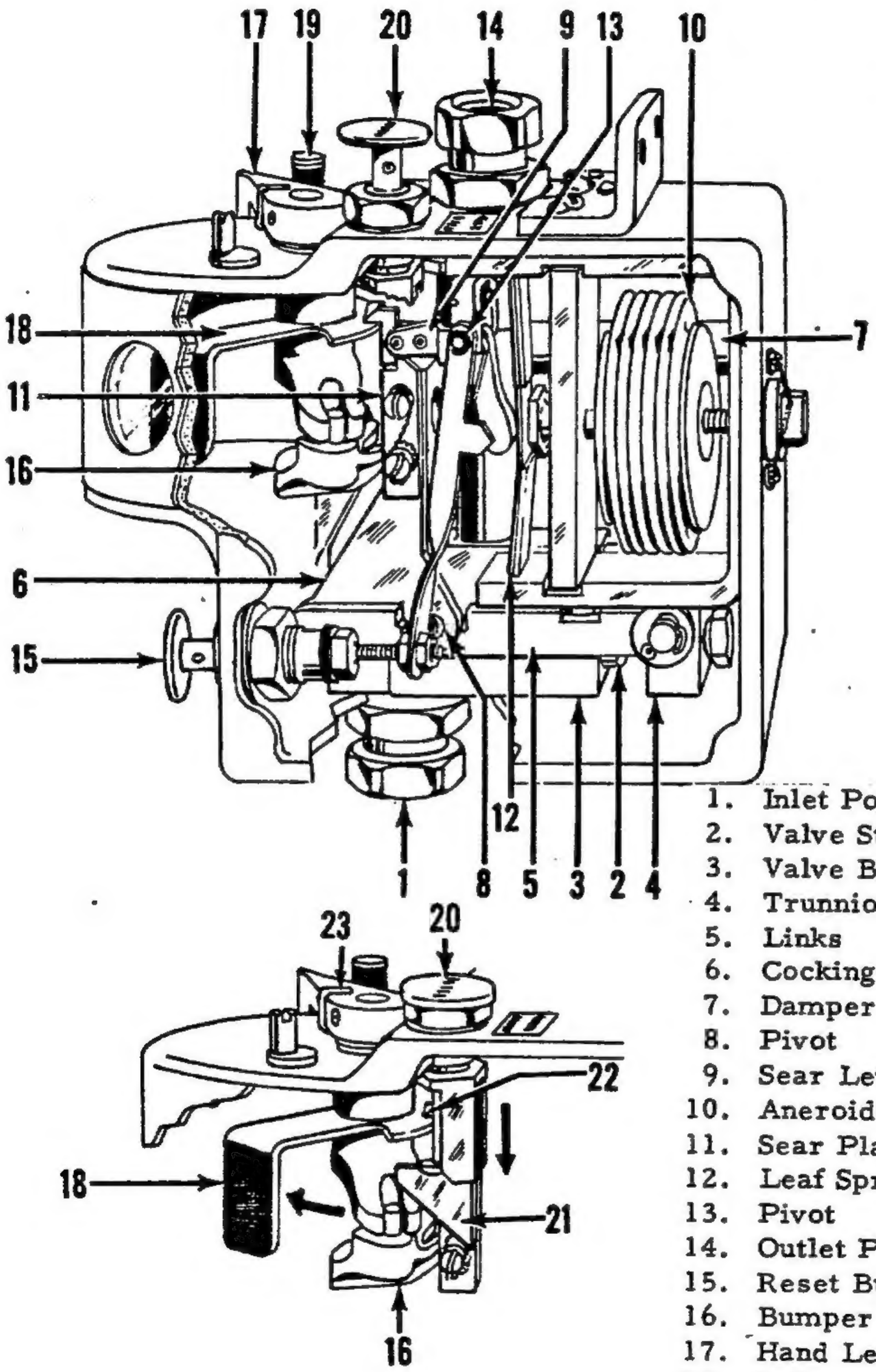
C.Operation (See figure 3.)

(1) Closed Position. High pressure oxygen enters the valve at inlet port. (1). Flow through the valve is prevented by valve stem (2) acting against its seat in body (3). The valve stem is connected through trunnion assembly (4), a pair of links (5) and cocking lever assembly (6) to spring loaded damper assembly (7). Opening of the valve is restrained by sear lever (9) which latches onto sear plate (11).

(2) Automatic Opening. One end of sear lever (9) contacts a leaf spring (12) on the aneroid assembly. The leaf spring is forced forward by expansion of the aneroid. When the aneroid expands sufficiently to force the leaf spring over its central position the spring trips and rotates sear lever (9), around pivot (13), away from the sear plate. This allows the springs on damper assembly (7) to rotate the cocking lever around pivot (8). Rotation of the cocking lever causes valve stem (2), through the connecting linkage, to move away from its seat thus allowing oxygen to flow out of valve outlet port (14).

(3) Aneroid Assembly. The aneroid in this valve expands linearly at reduced pressures and contracts at increased pressures. The expansion is used to trip a leaf spring which unlatches the valve and allows automatic turn-on. The aneroid assembly is adjusted so that the aneroid expands sufficiently to cause tripping of the spring at a pressure corresponding to an altitude at which oxygen is required for breathing. The design of the aneroid assembly features a sear lever (9) constructed to allow no play between its component parts, thus minimizing the possibility of accidental opening due to vibration or slippage. This also alleviates wear which might cause accidental automatic operation.

(4) Damper Assembly. The damper assembly acts to retard opening of the valve. The valve opens slowly because of the action of the damper assembly, thus minimizing temperature build-up which could cause an explosion or fire.



1. Inlet Port
2. Valve Stem
3. Valve Body
4. Trunnion Assembly
5. Links
6. Cocking Lever
7. Damper Assembly
8. Pivot
9. Sear Lever
10. Aneroid Assembly
11. Sear Plate
12. Leaf Spring
13. Pivot
14. Outlet Port
15. Reset Button
16. Bumper Link
17. Hand Lever
18. Indicator (Red)
19. Stop-Pin
20. Press-To-Open Button
21. Slide
22. Cam
23. Spring

Cutaway of Altitude Opened Valve Assembly
Figure 3

(5) Resetting and Closing. The valve can only be reset and closed after the aneroid contracts sufficiently to allow the leaf spring to be placed in the cocked position. The leaf spring is returned to the cocked position by depressing reset button (15) on the front of the valve. This action also allows sear lever (9) to move into position for latching sear plate (11). Sear plate (11) is moved to the latch position by bumper link (16) which is actuated by moving hand lever (17) to the closed position. Movement of the hand lever to the closed position also moves the valve stem and its connecting linkage to the closed position, compresses the springs on the damper assembly and on model 10350-5, moves a red indicator (18) to a position where it apprears in the window of the valve body. The valve is maintained in the closed position by the sear lever latching on the sear plate. On model 10350-5, when the hand lever is released it is returned by a spring (23) to the stop-pin (19) and the red indicator remains in the window.

(6) a. Manual Opening of the 10350-3 and -7 model Valves. Manual opening of these valves bypasses the aneroid assembly. Movement of the hand lever to the open position causes cam (22) to unlatch sear lever (9) from sear plate (11). The remaining linkage action is the same as automatic turn-on.

b. Manual Opening of the 10350-5, model Valve. Manual opening of the valve bypasses the aneroid assembly. Depressing "Press to Open" button (20) causes slide (21) to push against bumper link (16) rotating cam (22) against sear lever (9) unlatching it from sear plate (11). The remaining linkage action is the same as described in the automatic turn-on.

NOTE: Press the reset button prior to closing the valve after each operation. This is necessary in order to recock the leaf spring on the aneroid assembly.

(7) The 10350 series valves have a test nipple extending from the front of the valve. The automatic turn-on of the valve may be tested by drawing a vacuum at this fitting. The case of this valve is designed to hold a vacuum and consequently as pressure in the case is reduced by drawing a vacuum at the test nipple the aneroid assembly expands and causes automatic operation of the valve.

3. Disassembly (See figure 12.)

A. Remove covers (1 and 2) by cutting and removing lockwire (4) and seal (3); then remove screws (5) and washers (6). Remove gaskets (7).

B. On valve 10350-5, remove push button (8) by removing pin (9). Unscrew nut (10) and remove washers (11 and 12) and gasket (13). Remove lever (14) by removing pin (15); remove slide (16). Gasket (17) may now be removed from slide (16); then remove guide assembly (18), spring (19) and pin (20).

C. Remove push button (21) by unscrewing setscrew (22). Remove spring (23) and nuts (24);remove lever (31) from push rod (25). Remove push rod (25) and gasket (26). Remove retainer (27) by unscrewing and removing nut (28) and washer (29). Then remove gasket (30) and lever (31).

NOTE: To remove lever (31), remove retaining ring (part of aneroid assembly (32); remove the lever, and replace the retaining ring.

D. Manually open the valve (refer to paragraph 2, step C (6)). Remove aneroid assembly (32) by cutting and removing lockwire (34) and seal (33); then remove screws (35) and washers (36). Remove cap (37), retainer (38) and packing (39).

WARNING: DO NOT ATTEMPT TO DISASSEMBLE THE ANEROID ASSEMBLY TO REPLACE DEFECTIVE PARTS. IF ANY PART OF THIS ASSEMBLY IS FOUND TO BE DEFECTIVE, REPLACE THE ENTIRE ANEROID ASSEMBLY.

E. Close the valve (refer to paragraph 2, step C (5)). Remove retaining ring (42) and manually open valve (refer to paragraph 2, step C (6)). Drive out pin (41) and remove damper assembly (40) from the valve body.

WARNING: DO NOT ATTEMPT TO DISASSEMBLE THE DAMPER ASSEMBLY. A DEFECTIVE DAMPER ASSEMBLY MAY CAUSE THE VALVE TO OPEN TOO QUICKLY. IF ANY PART OF THE DAMPER ASSEMBLY IS FOUND TO BE DEFECTIVE, REPLACE THE ENTIRE DAMPER ASSEMBLY.

F. On valves 10350-3 and -7, proceed with disassembly as follows:

(1) Remove hand lever (43) by removing spring pin (44).

(2) Remove washer (45) and disassemble crank assembly (46 through 51) as follows:

(a) Remove crank subassembly (47 through 50) from shaft (51) by removing pin (46).

(b) Disassemble crank subassembly (47 through 50) by removing pins (47). Washer (48) and cam (49) are now free of crank (50).

G. Remove packing (52).

H. On valves 10350-5, proceed with disassembly as follows:

(1) Remove control crank assembly (54 through 57) by removing pin (53).

(2) Disassemble the control crank assembly by removing indicator (54), which is held by pins (55), then remove washer (56) and crank (57).

(3) Remove lever and shaft assembly (58 through 65) and disassemble as follows:

(a) Remove hand lever assembly (59 and 60) by removing ring (58).

(b) Remove sleeve (61) by removing pin (62), then remove spring (63) and washer (64) from shaft (65).

I. Remove trunnion links (67) by removing pins (68) and washers (69). Remove cocking lever assembly (71 through 81) by removing pins (70) as follows:

(1) Assemble a 6-32 nut onto a 6-32 by 3/4 inch socket head screw.
(2) Place a 1/4 inch hex nut over pin (70) and place a small washer on the nut.
(3) Screw the 6-32 screw and nut assembly into pin (70).

(4) Tighten the 6-32 nut on the screw against the washer on the 1/4 inch hex nut.

(5) Hold the 6-32 nut stationary and tighten the 6-32 screw. This action pulls pin out of body (104).

(6) Repeat this procedure on other pin (70).

J. Disassemble the removed cocking lever assembly (71 through 81) as follows:

(1) Remove detent spring (71) by removing screws (72) and washers (73).

(2) Remove sear plate (74) by cutting lock wire (75) and removing screws (76), washers (77) and pin (78).

(3) Remove firing spring pin (79) and link pins (80) from cocking lever (81).

K. Remove bumper link assembly (83 through 85) by removing ring (82); then disassemble the bumper link assembly by removing pin (83) and sleeve (84) from bumper link (85).

L. Remove nuts (86) and washers (87). Unscrew and remove connectors (88) and washers (89).

NOTE: Valve body (104) may tend to rotate when unscrewing connectors (88). To prevent rotation, clamp valve body (104) to automatic valve body (133) using a spacer block on the flats of valve body (104) to build up the thickness to match the width of the automatic valve body. (Spacer blocks can be easily fabricated of wood or phenolic). Use care to avoid damaging the external threads of connectors. (88).

M. Remove altitude triggered valve assembly (99 through 104) by cutting and removing lockwire (96), screws (95 and 97) and washers (98).

N. Remove bushing (90) from the removed altitude triggered valve assembly by unscrewing setscrew (91) and plug (92); then remove trunnion assembly (93 and 94).

O. Disassemble altitude triggered valve assembly (99 through 104) as follows:

(1) Remove valve cap (99); then remove retainer (100) and packing (101) from valve cap (99).

(2) Remove washer (102) and valve stem assembly (103) from body (104).

P. On valves 10350-3 and -7, remove lever stop (105) by removing nut (106) and washer (107).

Q. On valves 10350-5 remove cushion (108) by removing stop pin (109).

R. Remove and disassemble connection assembly (114 through 117) as follows:

(1) Cut and remove lockwire (111) and seal (110).

(2) Remove screws (112) and washers (113).

(3) Unthread screw (114); then remove filter screen (115) from body (116).

S. Remove gasket (117). Disassemble automatic valve body assembly (118 through 133) as follows:

(1) Remove pin (118) and bushing (119).

(2) On valves 10350-5, remove window (120). Remove instruction plate (121) by removing screws (122).

(3) Remove identification plate (123) and instruction plate (125) by removing screws (124 and 126) from body (133).

(4) Remove plug (127). If necessary to remove brackets (128 and 130), drill out rivets (129 and 131).

(5) Remove packing (132) from under bracket (130).

4. Cleaning

WARNING: DO NOT USE OIL OR OIL BASE SOLVENTS ON OXYGEN EQUIPMENT. AN EXPLOSION WITH SERIOUS RESULTS MAY OCCUR.

A. Remove dirt and foreign particles from equipment by wiping with a clean lint-free cloth, or by blowing with clean oil-free air or nitrogen.

B. Metal parts which come in contact with oxygen and have become contaminated with grease can be cleaned by one of the following methods.

(1) Method A. Use a vapor degreasing method with stabilized trichlorethylene conforming to Specification MIL-T-7003. Blow clean and dry with a stream of clean, dry, oil-free air or nitrogen.

WARNING: USE NORMAL PRECAUTIONS WHEN HANDLING TRICHLORETHYLENE SINCE THIS CHEMICAL MAY BE HARMFUL TO THE OPERATOR.

(2) Method B. Flush with naptha conforming to Federal Specification TT-N-95. Blow clean and dry of all solvent with oil-free air or nitrogen. Flush with anti-icing fluid conforming to Specification MIL-F-5566 or anhydrous ethyl alcohol. Rinse thoroughly with a stream of clean, dry, oil-free air or nitrogen or by heating at a temperature of 121 degrees C (250 degrees F) to 149 degrees C (300 degrees F) for a suitable period.

(3) Method C. Flush with hot inhibited alkaline cleaner until free of oil and grease. Rinse thoroughly with a stream of clean, dry, oil-free air or nitrogen, or by heating at a temperature of 121 degrees C (250 degrees F) to 149 degrees C (300 degrees F) for a suitable period.

C. Tarnish that cannot be removed from metal parts by one of the above methods may be removed by the following method.

(1) Prepare a solution composed of 4 ounces green soap, 4 ounces olicacid, 8 ounces acetone and 16 ounces ammonia water base.

(2) Immerse tarnished parts in solution for a few seconds.

(3) Remove parts from solution, clean with filtered benzene, rinse with alcohol, flush with water and dry with clean, oil-free air or nitrogen.

CAUTION: BEFORE PERFORMING ANY CLEANING PROCEDURE MAKE SURE ALL MATERIALS ARE AVAILABLE TO COMPLETE ALL STEPS. .OMISSION OF ANY STEP IS DANGEROUS DUE TO CONTINUOUS CHEMICAL ACTION UPON THE PART BEING CLEANED.

5. Inspection

A. Carefully inspect all metal parts for cracks, nicks, dents, burrs or tool marks which might cause malfunction of the valve assembly.

B. Inspect valve stem (103, figure 12) for scoring and other signs of damage (refer to paragraph 6, step F).

C. Carefully inspect damper assembly (40) for evidence of leakage (refer to paragraph 6, step E).

D. Inspect aneroid assembly (32) for signs of leakage or corrosion (refer to paragraph 6, step D).

E. Check all threads for burrs and signs of damage.

6. Repair and Replacement

A. Repair of parts is not recommended.

B. Polish metal parts sufficiently to remove burrs, nicks, or tool marks. If protective finish is polished off, passivate stainless steel parts, and brush chemical film on aluminum parts per Specification MIL-C-5541.

C. Replace all gaskets and preformed packings.

D. Aneroid assembly (32, figure 12) should not be repaired at overhaul facilities. If any part of this assembly is defective or requires repair, replace the entire assembly.

E. If leakage occurs at damper assembly (40) or the damper loses its dampening quality (refer to paragraph 8, step F) replace the entire damper assembly since repair is impractical.

F. Replace valve stem (103) if part shows signs of damage or scoring.

G. Replace all obviously defective parts.

7. Assembly (See figure 12)

A. Replace packing (132) and attach brackets (130 and 128) to body (133) with rivets (129 and 131). Replace plug (127).

B. Secure instruction plate (125) to body (133) with screws (126). Secure identification plate (123) to body (133) with screws (124).

On valves 10350-5, secure instruction plate (121) to body (133) with screws (122). Secure window (120) to body (133) using cement EC847 (Minnesota Mining & Manufacturing Co., Detroit, Mich.), conforming to Specification MIL-C-4003, or an equivalent.

C. Press bushing (119) and pin (118) into body (133).

D. Replace filter screen (115) and secure with screw (114) in connector (116). Replace gasket (117) and attach connector (116) with washers (113) and screws (112). Secure screws with lock wire (111) and seal (110).

E. On valves 10350-5, place cushion (108) on pin (109) and screw pin (109) into body (133).

F. On valves 10350-3 and -7, place stop (105) within hole provided in body (133) and secure in place with nut (106) and washer (107).

G. Assemble altitude triggered valve assembly (99 through 104) as follows:

(1) Place valve stem assembly (103) in valve body (104).

(2) Place retainer (100) and packing (101) into valve cap (99). Place washer (102) in place and thread valve cap (99) into valve body (104).

NOTE: Approximately 175 inch pounds torque is required to seal valve cap (99).

(3) Perform a leak test of the assembled altitude triggered valve assembly (99 through 104) in accordance with paragraph 8, step A.

H. Continue assembly by placing link pins (93) into trunnion (94). Place trunnion assembly (93 and 94) on valve stem assembly (103). Screw valve stem adjustment bushing (90) into trunnion assembly (93 and 94). Place plug (92) and setscrew (91) in trunnion assembly. Do not tighten setscrew (91) at this point in assembly.

I. Assemble cocking lever assembly (71 through 81) as follows:

(1) Press pins (80) into and flush with cocking lever (81).

(2) Press pin (79) into cocking lever (81).

(3) Locate sear plate (74) on the bottom of cocking lever (81) and secure in place with screws (76) and washers (77). Do not install pin (78) until after adjustment of sear plate (74) at completion of assembly. Secure screws (76) with lock wire (75).

(4) Secure detent spring (71) with screws (72) and washers (73). Apply Glyptol 1201 (General Electric Supply Co., Buffalo, New York) or equivalent, to the threads of screws (72) prior to assembly.

J. Secure assembled cocking lever assembly (71 through 81) to valve body (104) with pins (70).

K. Secure trunnion links (67) in place with washers (69) and cotter pins (68).

L. Perform a leak test of the components assembled in paragraph 7, steps H through K, in accordance with paragraph 8, step B.

M. On valves 10350-3 and -7, continue with assembly as follows:

(1) Attach packing (52) to shaft (51) and then assemble shaft (51) to control crank (50) with pin (46).

(2) Assemble control crank assembly (46 through 51) by securing cam (49) and washer (48) to shaft (51) with pins (47). Rivet both pin ends and file flush with the surface of the control crank.

(3) Place shaft (51) through its opening in valve body (133).

(4) Place washer (45) on shaft (51) and attach hand lever (43) to the shaft with pin (44).

N. On valves 10350-5, continue with assembly as follows:

(1) Assemble control crank assembly (54 through 57) by securing washer (56) and indicator (54) to control crank (57) with pins (55). Rivet both pin ends and file flush with the surface of the control crank.

(2) Assemble lever and shaft assembly (58 through 65) by by placing packing (52), washer (64), and spring (63) on shaft (65); place sleeve (61) on shaft (65) and retain with pin (62). Press pin (59) into hand lever (60); then place hand lever assembly (59 and 60) over sleeve (61) and retain with retaining ring (58).

(3) Assemble control crank assembly (54 through 57) and lever and shaft assembly (58 through 65) with automatic valve body (133) and secure with pins (53).

O. Press pin (83) and sleeve (84) into bumper link (85). Secure assembled bumper link assembly (83 through 85) to link pin (118) with retaining ring (82). Pin (83) must fit into the fork on control crank (50 or 57) without evidence of binding.

P. Place the components assembled in paragraph 7, steps G through J, in body (133) and secure with screw (95). (Screws (97), washers (98) and lockwire (96) are also used on valves, 10350-3 and -7.)

Q. Install washer (89) and connectors (88). Clamp valve body (104) to body (133), using spacer blocks on the flats of valve body (104) to build up the thickness of valve body (104), to the width of body (133). Tighten the connectors into the valve body using a torque of 250 inch pounds.

R. Place washers (87) on connectors (88); then thread nuts (86) on the connectors and tighten using a torque of 140 inch pounds. Bend the tabs of washers (87) to prevent accidental opening of nuts (86).

S. Perform a leak test of the partially assembled altitude opened valve assembly in accordance with paragraph 8, step C.

T. Assemble packing (39), retainer (38), and cap (37) to aneroid assembly (32), then place aneroid assembly (32) in body (133). Secure the aneroid in position with screws (35) and washers (36). Secure with lockwire (34) and seal (33). Searing cam (49) or indicator (54) must fit into the fork in the sear lever on aneroid assembly (32).

NOTE: Check operation of hand lever (43 or 60) on control crank (50 or 57). There should be no evidence of binding.

U. Install damper assembly (40). Connect the cylinder end of the damper to pin (79) on the cocking lever assembly with retaining ring (42). Assemble the piston lug of the damper assembly to body (133) with pin (41).

V. Assemble and install the reset assembly as follows:

(1) Place gasket (30) in body (133). Place retainer (27) through body (133) and secure with nut (28) and washer (29).

(2) Place spring (23) in retainer (27). Place gasket (26) on rod (25) and place rod (25) through bottom of retainer (27).

(3) Place push button (21) into top of retainer (27) and secure push button (21) to rod (25) with setscrew (22).

(4) Thread one nut (24) on rod (25). Place end of lever (31) on rod (25) and secure to rod (25) with other nut (24).

(5) Secure other end of lever (31) to aneroid assembly (32) by removing retaining ring on aneroid assembly, placing end of lever over pin of aneroid assembly, and replacing the retaining ring.

W. On valves 10350-5, assemble and install the press to open assembly as follows:

(1) Place guide assembly (18) through hole in body (133) and pin in place with pin (20). Assemble gasket (13) to guide assembly. Secure the guide assembly to body (133) with nut (10) and washers (11 and 12).

(2) Place spring (19) in guide assembly (18). Place gasket (17) on slide (16) and place the slide in guide assembly (18). Place push button (8) in guide assembly (18) and secure the push button to the slide with pin (9).

(3) Secure lever (14) to guide assembly (18) with pin (15).

X. Check operation of the partially assembled valve assembly (reference paragraph 2, step C (5) and (6)).

NOTE: Slight adjustment of sear plate (74) may be required to obtain a perfect latch. Loosen screws (76) and slide the sear plate into its proper location. Tighten screws (76) and drill a hole, if required, for pin (78) in cocking lever (81). Install pin (78).

Y. Prior to assembly of remaining items (1 through 7), test the partially assembled valve assembly in accordance with paragraph 8, steps D, E and F.

Z. Secure gaskets (7) and covers (1 and 2) to body (133) with screws (5) and washers (6). Attach lockwire (4) and seal (3) through screws (5).

AA. Test the completely assembled valve assembly in accordance with paragraph 8, step G.

8. Testing

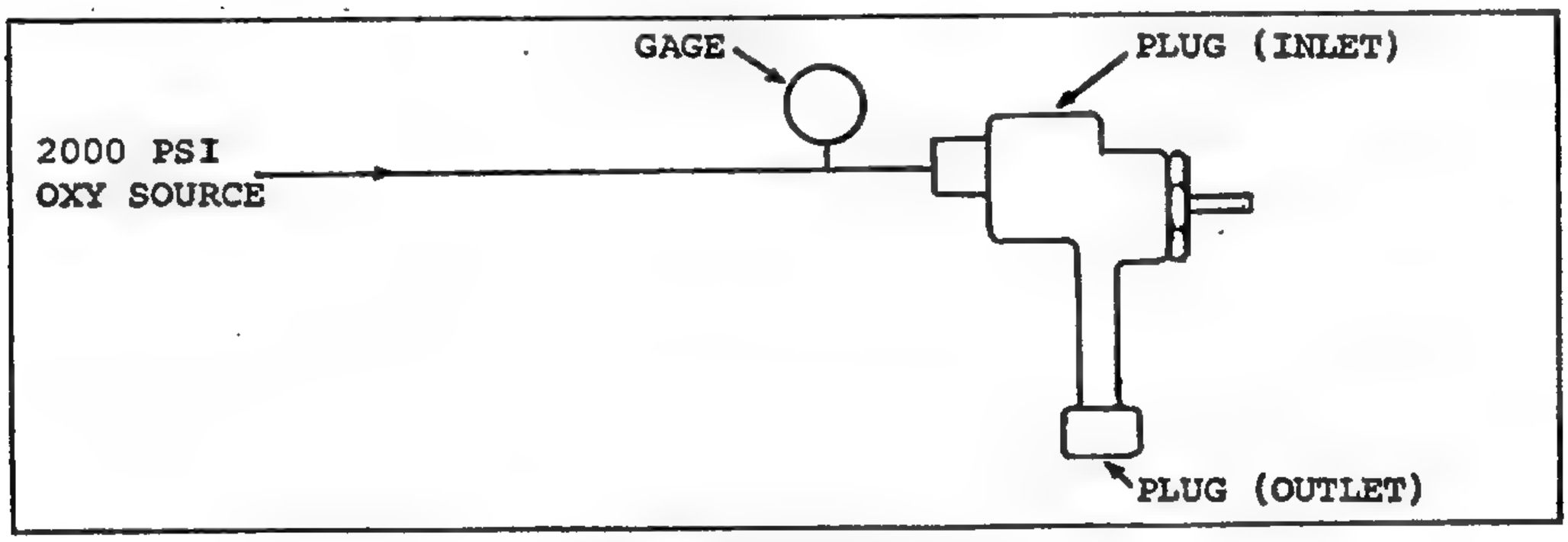
A. Perform a leak test of the assembled altitude triggered valve assembly in accordance with the test setup illustrated in figure 4 and the following procedure (refer to paragraph 7, step G (3)).

(1) Plug the inlet and outlet ports.

(2) Slowly apply 2000 psi oxygen pressure to gage tap.

(3) Apply leak test solution, conforming to Specification MIL-L-25567, to area of valve cap (99, figure 12). No leakage shall be evident.

(4) After completion of test, close off source pressure, remove valve assembly from test setup and remove plugs, blow dry with a stream of clean, dry, oil-free air, and continue assembly (refer to paragraph 7, step H.)



Leakage Test Setup No. 1
Figure 4

B. Perform a leakage test of the partially assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 5 and the following procedure (refer to paragraph 7, step L).

(1) Attempt to close the valve assembly by moving cocking lever (81, figure 12) parallel to the stem of valve body (104). Cocking lever (81) should never

be forced into the closed position. If considerable force is required to close the valve assembly, it is an indication that valve stem adjusting bushing (90) is improperly adjusted. Adjust the valve stem adjusting bushing as follows:

(a) Loosen setscrew (91) and back valve stem adjusting bushing (90) a few turns out of trunnion (94). A clearance of approximately 1/16 inch should exist between the back face of cocking lever (81) and the stem of valve body (104).

CAUTION: THE ADJUSTMENT FOR VALVE STEM SEATING PRESSURE IS EXTREMELY SENSITIVE. OVER-ADJUSTMENT CAN LEAD TO CONSIDERABLE INTERNAL DAMAGE.

(b) After adjustment, tighten setscrew (91).

(2) Close the valve assembly after adjustment.

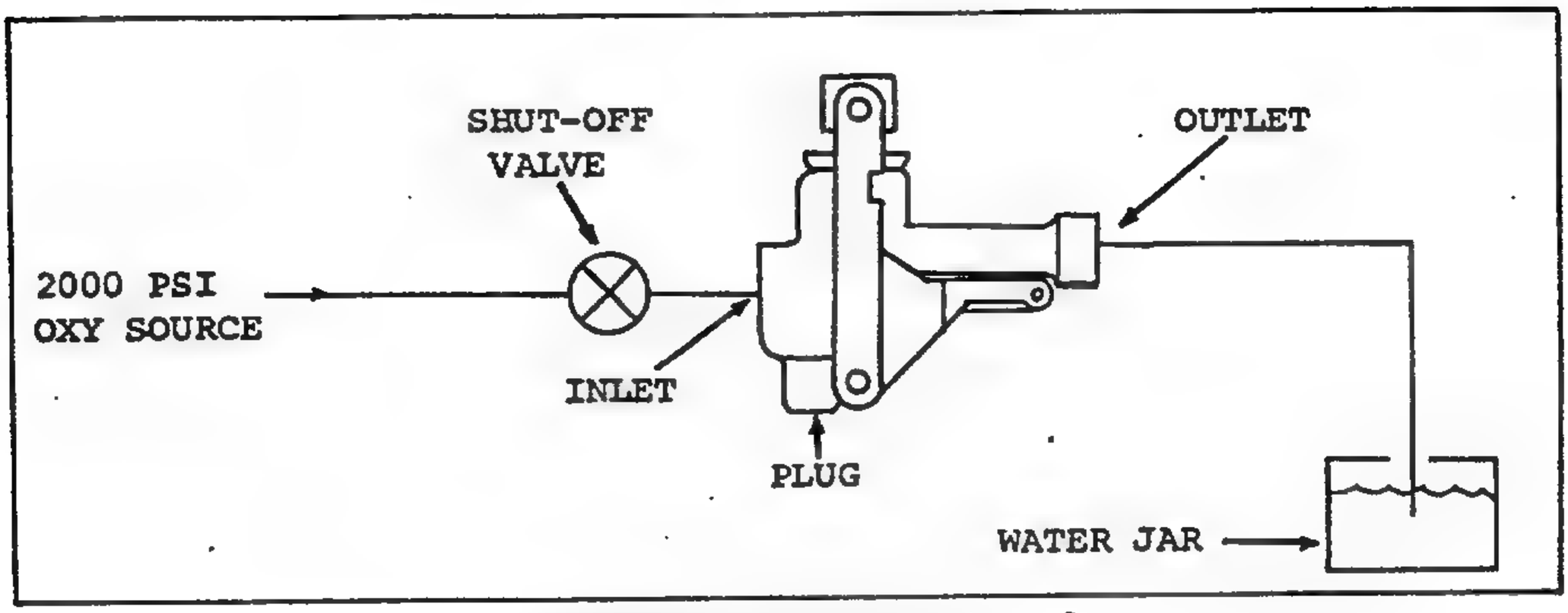
(3) Plug gage tap. Apply 2000 psi oxygen to the inlet port by slowly opening the shut-off valve.

(4) Apply leak test solution, conforming to Specification MIL-L-25567, to area of valve cap (99).

(5) There shall be no leakage at valve cap (99). Bubbles indicate leaks which must be corrected before continuing.

(6) There shall be no leakage (leakage indicated by bubbles in water container) at valve outlet port. If bubbles apprear, oxygen is flowing through the valve assembly, indicating a need for adjustment of valve stem adjusting bushing (90). Adjust the valve assembly per steps (a) and (b) above until all leakage through the valve is eliminated.

(7) After completion of test, close shut-off valve, remove valve assembly from test setup and remove plug, blow dry with a stream of clean, dry, oil-free air, and continue assembly (refer to paragraph 7, step M).



Leakage Test Setup No. 2
Figure 5

C. Perform a leakage test of the partially assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 6 and the following procedure (refer to paragraph 7, step S).

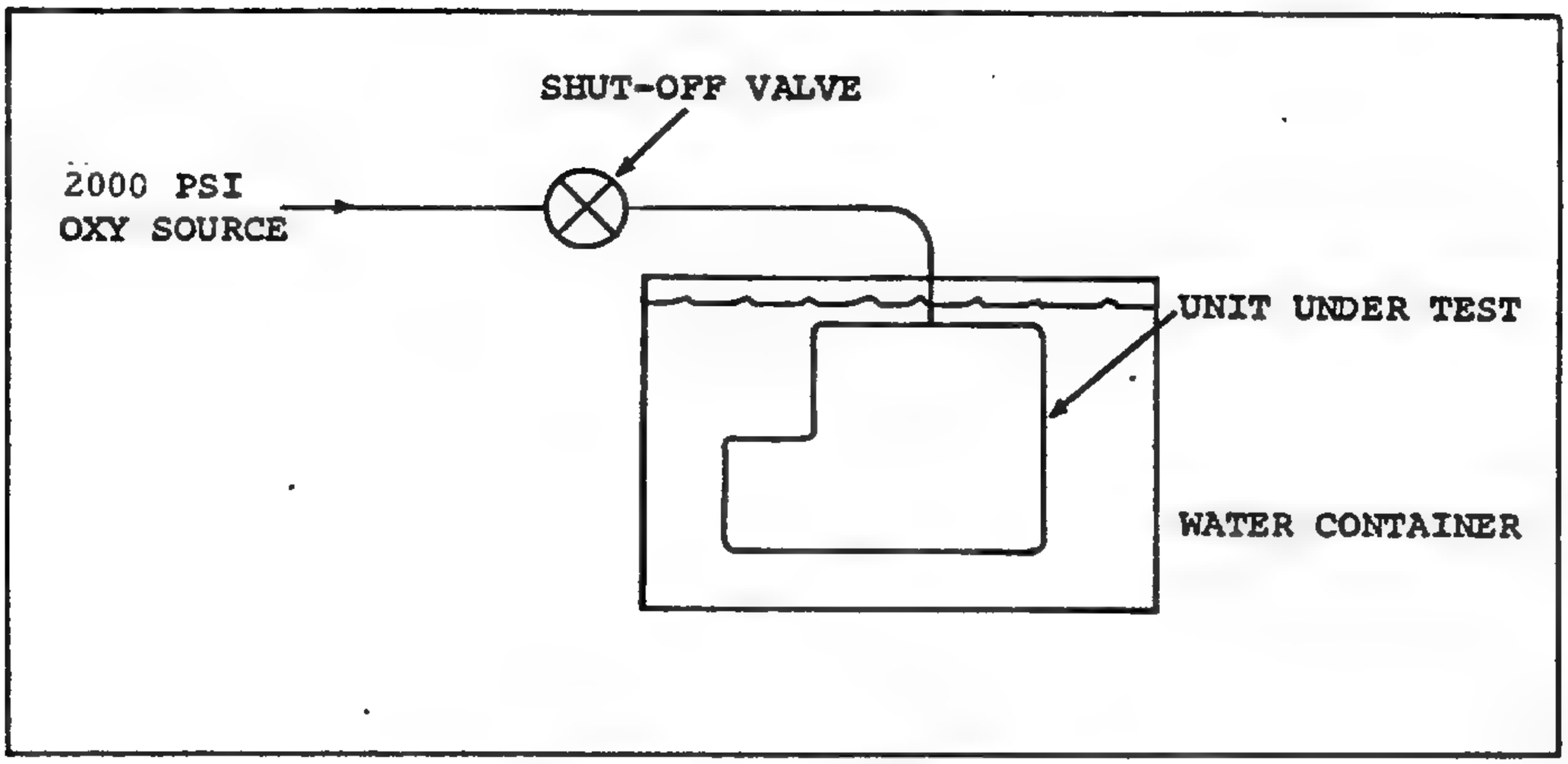
(1) Plug the outlet port and gage port of unit under test.

(2) Open the valve by moving cocking lever (81, figure 12) away from the stem of valve body (104).

(3) Immerse the test unit in the water. Apply 2000 psi oxygen to the inlet port by slowly opening the shut-off valve.

(4) Observe connectors (88) and area of valve cap (99) for leaks. No leakage shall be evident. Bubbles indicate leaks which must be corrected before continuing.

(5) After completion of test, close shut-off valve, remove unit under test from test setup and remove plugs, blow dry with a stream of clean, dry, oil-free air, and continue assembly (refer to paragraph 7, step T).



Leakage Test Setup No. 3
Figure 6

D. Perform a flow test of the partially assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 7 and the following procedure (refer to paragraph 7, step Y).

(1) Close the valve assembly, the shut-off valve, and the metering valve.

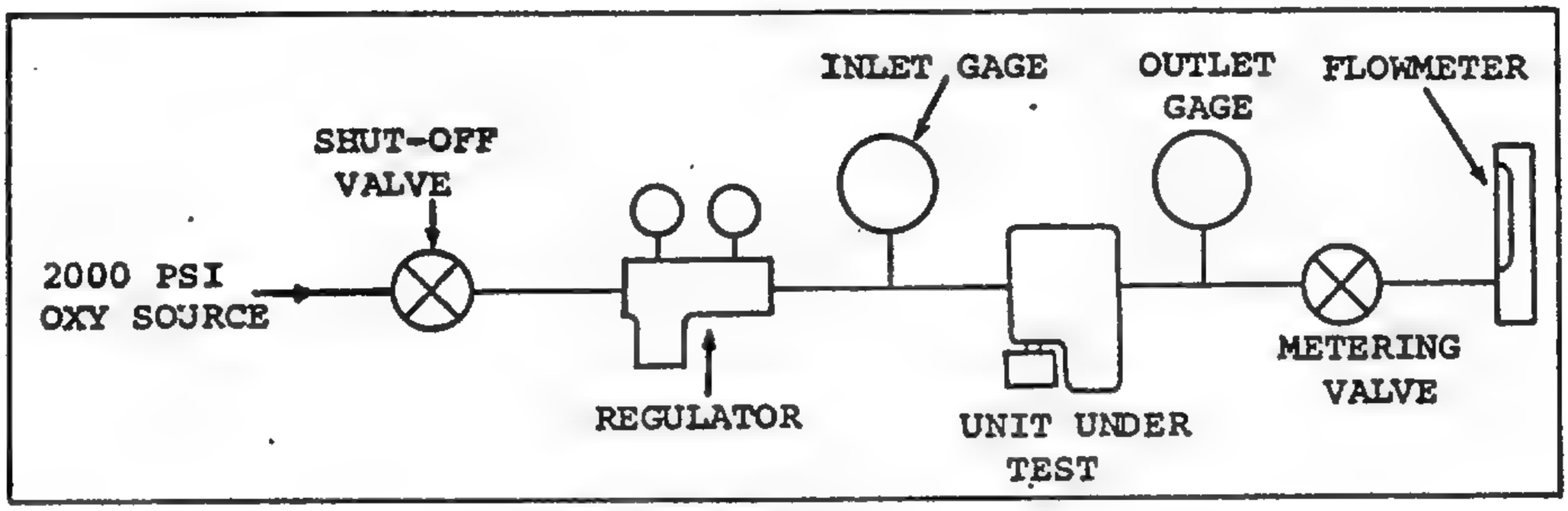
(2) Open the valve assembly by tripping the leaf spring on aneroid assembly (32, figure 12).

(3) Apply pressure to inlet in accordance with Table I. Outlet pressure and flow should be as listed in the table.

	INLET PRESSURE (psi)	OUTLET PRESSURE (psi min.)	FLOW (LPM) 760 mmHG @ 20° C	ANEROID TRIP POINT (mm HG)	ASSEMBLY TRIP POINT (mm HG)
10350-3	100	80	600	435-445	430-450
10350-5	100	80	600	435-445	430-450
10350-7	100	65	400	496-507	493-512

TABLE I

(4) After completion of test, close shut-off valve, close metering valve, remove the unit under test from test setup. and continue testing (refer to paragraph 8, step E).



Flow Test Setup
Figure 7

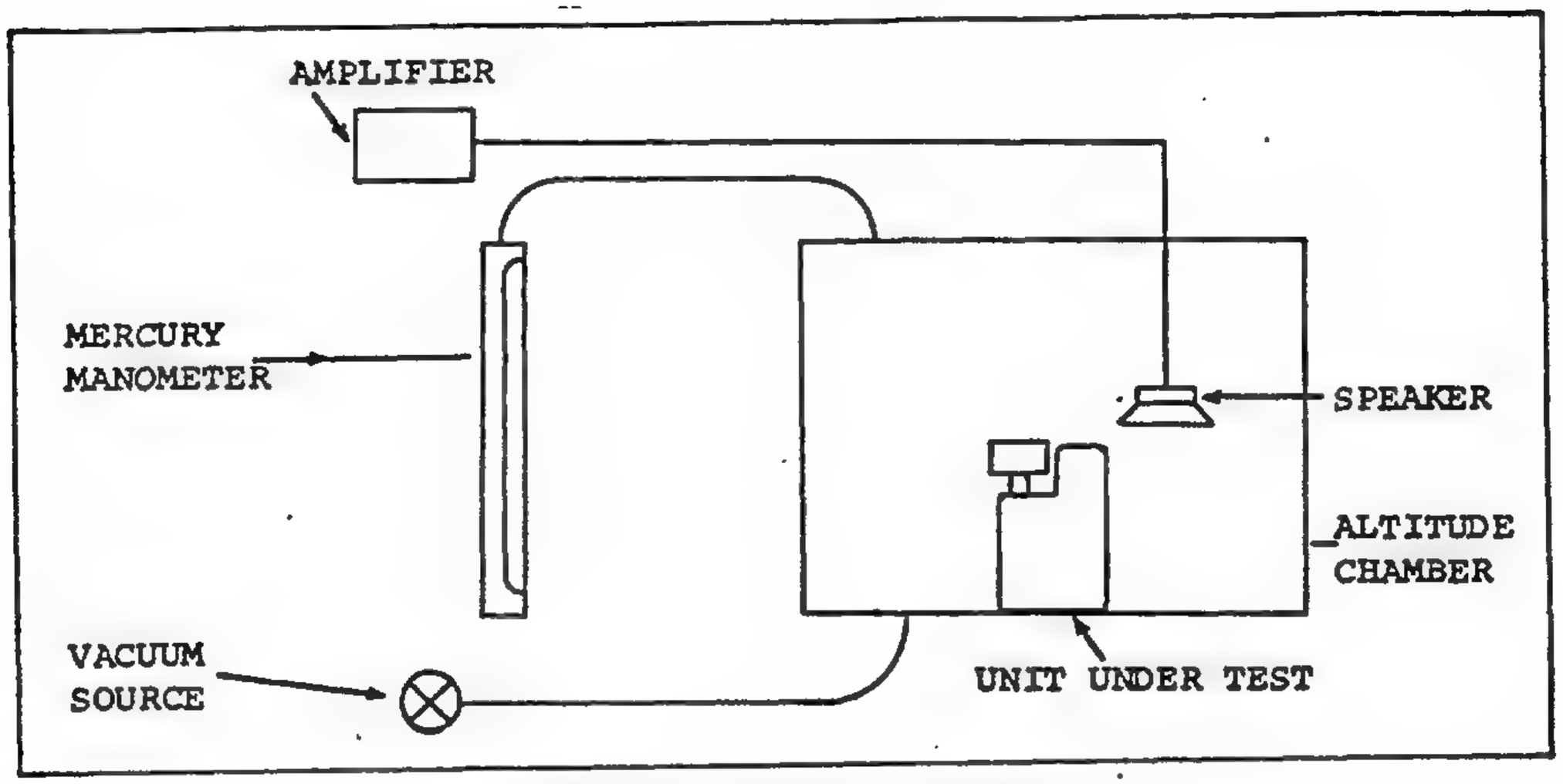
E. Perform an aneroid trip test of the partially assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 8 and the following procedure (refer to paragraph 7, step Y).

(1) Close the valve assembly under test.

(2) Place the unit under test in the altitude chamber and evacuate the chamber using the vacuum source valve.

(3) The leaf spring of aneroid assembly (32, figure 12) should trip between values listed on Table I, causing the valve to open. (This reading should be taken from the manometer when the leaf spring is heard to trip on the amplifier).

NOTE: Be sure mercury manometer is set for barometric pressure.



Aneroid Trip Test Setup
Figure 8

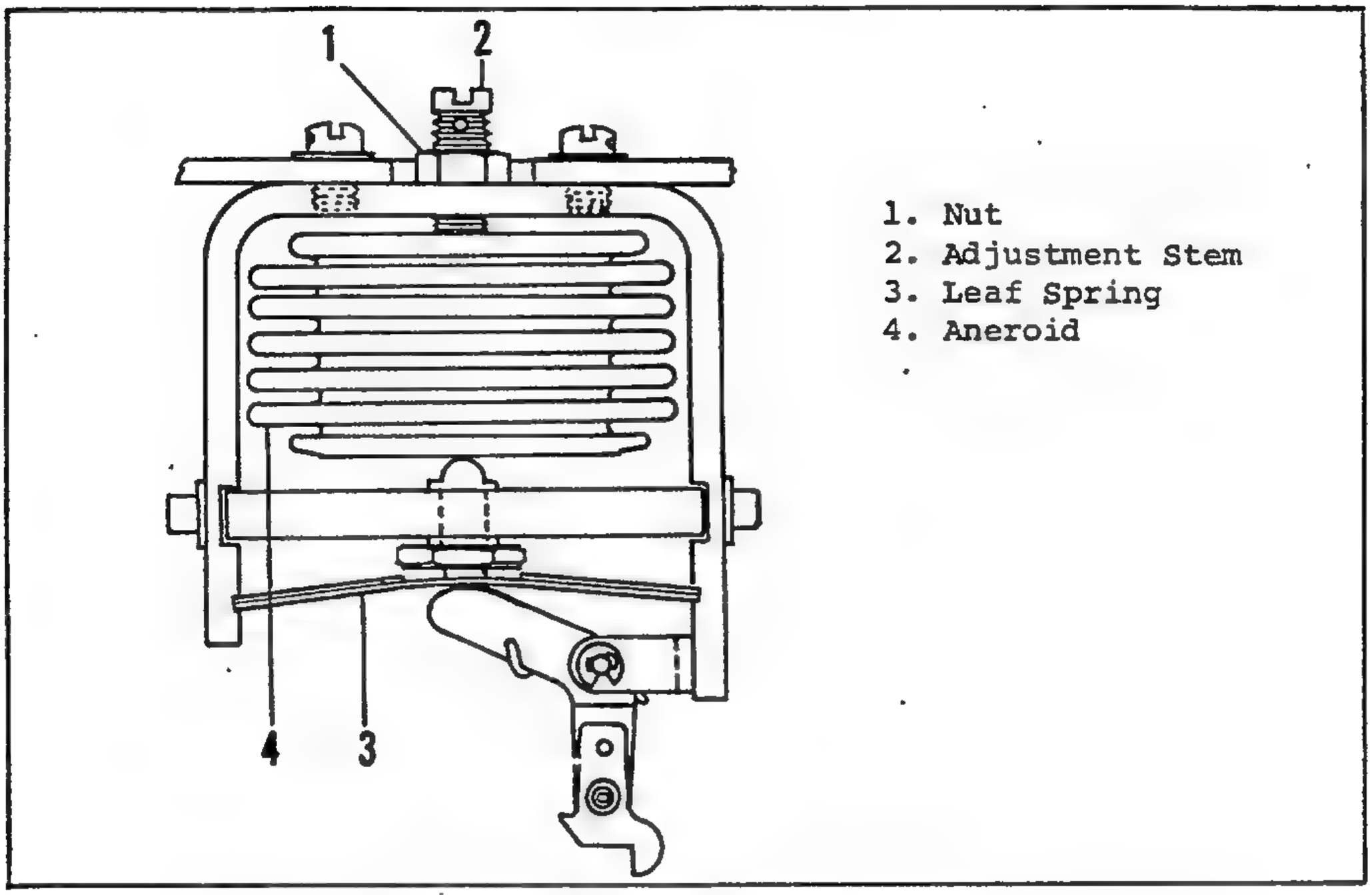
(4) If the leaf spring fails to trip at the correct values listed, adjust the aneroid assembly as follows: (see figure 9).

(a) If leaf spring (3) trips at more than maximum loosen nut (1) and turn adjustment stem (2) of aneroid (4) counter-clockwise. If leaf spring (3) trips at less than minimum, turn adjustment stem (2) clockwise.

(b) After adjustment, tighten nut (1) and retest per paragraph 8, step E above.

(5) After completion of test, use lockwire (34, figure 12) and seal (33) to secure adjustment stem of aneroid assembly (32) to screws (35).

(6) Remove unit under test from altitude chamber and continue testing (refer to paragraph 8, step F).



1. Nut
2. Adjustment Stem
3. Leaf Spring
4. Aneroid

Aneroid Assembly Adjustment
Figure 9

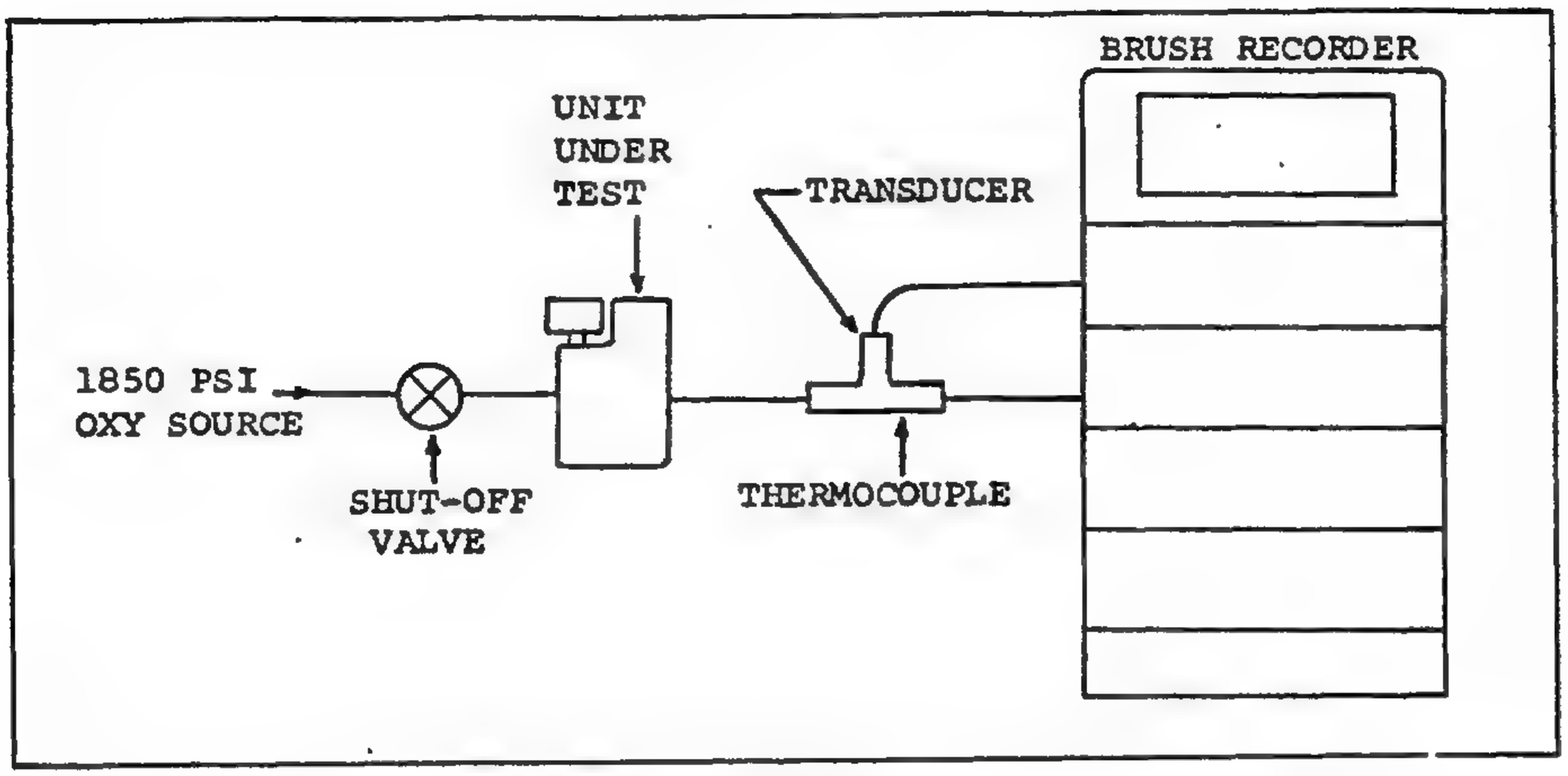
F. Perform a pressure and temperature rise test of the partially assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 10 and the following procedure (refer to paragraph 7, step Y).

(1) Close shut-off valve and unit under test and calibrate brush recorder for temperature and pressure.

(2) Slowly open the shut-off valve.

(3) Trip the leaf spring of aneroid assembly (32, figure 12) and start the recorder at the same time.

(4) Pressure build-up from 0 to 1850 psi should not take less than 0.3 seconds and total opening time should not exceed 3 seconds (check by stop watch). Temperature build-up should not exceed 125°F above ambient.



Pressure and Temperature Rise Test Setup
Figure 10

NOTE: The figures given above are for ambient room temperature (72°F). The recorder chart shows temperature rise on one track and pressure on the other.

(5) After completion of test, close shut-off valve, remove the unit under test from test setup, and complete assembly (refer to paragraph 7, step Z).

G. Perform a case leakage test of the completely assembled altitude opened valve assembly in accordance with the test setup illustrated in figure 11 and the following procedure. (refer to paragraph 7, step AA)

(1) Install valve in test stand, figure 11.

(2) Close valve.

(3) Apply 100 psi pressure to inlet.

(4) Apply vacuum to initiate tripping of valve. Valve should trip in accordance with values shown in Table I.

(5) Record trip point and case leakage. Leakage not to exceed 10 LPM at valves highest altitude.

NOTE: Valve should remain open until manually closed.

H. Perform overall leakage test in accordance with the following procedure:

(1) Connect inlet of valve to 1850 psi pressure source. Gas to consist of 20% by volume of Freon 13 and 80% by volume of clean dry breathing air or Nitrogen.

(2) Plug valve outlet and open valve.

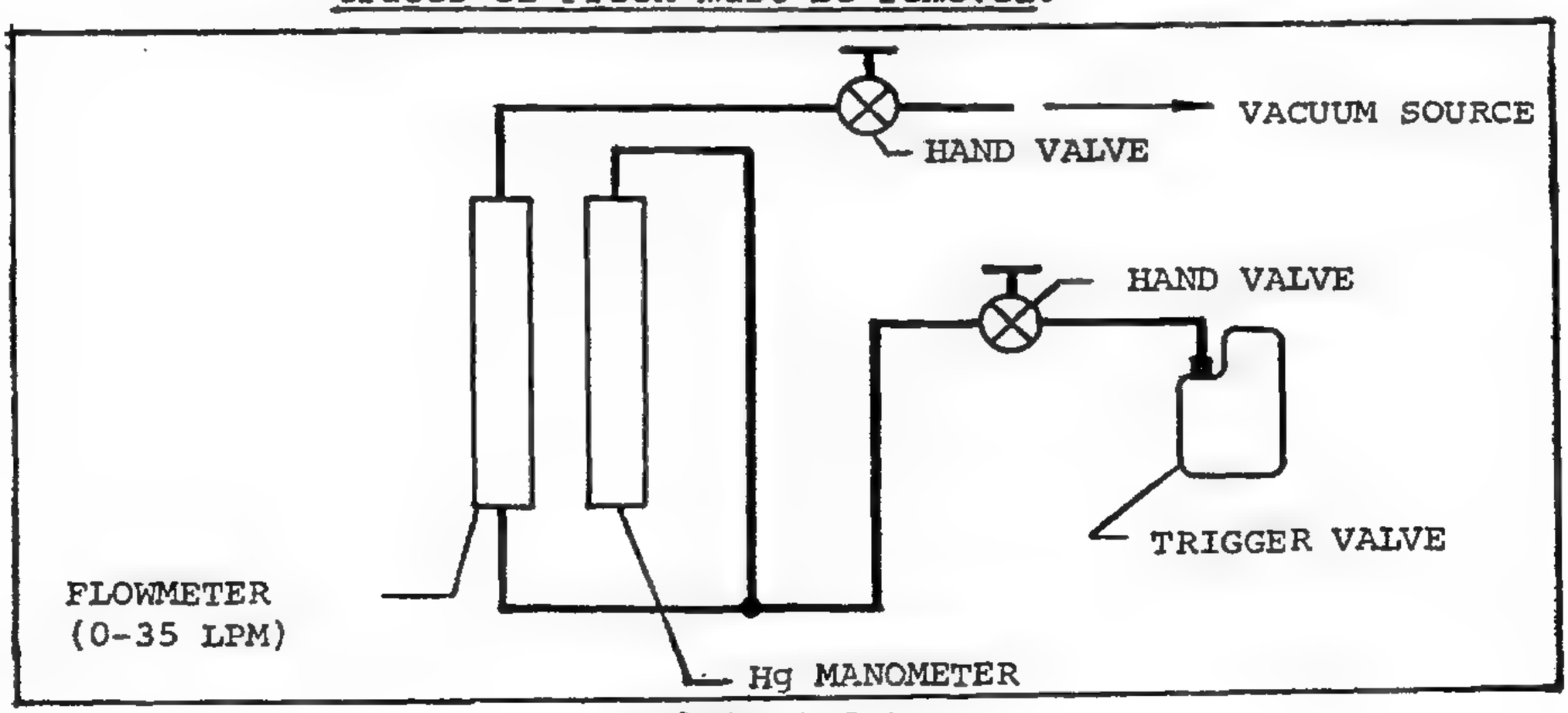
(3) Apply 1850 psi pressure.

(4) Using a General Electric type H (or equivalent) leak detector, examine the inlet and outlet connectors next to the valve body and the pipe plug opening.

(5) A defection of greater than 10% of full scale on the detector indicating meter is cause for rejection.

NOTE: The leak detector should be adjusted to its medium range position.

(6) Upon acceptance remove the valve from the test fixture and purge inside and out with pure oxygen. All traces of Freon must be removed.



Leak Test Setup
Figure 11

9. Trouble Shooting

A. See Table II for trouble shooting chart.

TROUBLE	PROBABLE CAUSE	REMEDY
Leakage at outlet port of valve assembly when valve assembly is closed.	Valve assembly not completely closed.	Adjust valve stem adjusting bushing (90, figure 12) per paragraph 8, step B (1), (a) and (b).
Leakage at connectors (88, figure 12).	Loose connectors and/or gage.	Tighten connector (s) and/or gage as required.
Valve assembly fails to open automatically at proper altitude.	Aneroid assembly (32, figure 12) out of adjustment.	Adjust aneroid assembly per paragraph 8, step E (4).
	Faulty aneroid assembly.	Replace aneroid assembly.
Valve assembly opens too rapidly .	Faulty damper assembly (40).	Replace the damper assembly.
Leakage at valve stem assembly (103).	Faulty preformed packing (101).	Replace preformed packing.
	Scored or damaged valve stem assembly (103).	Replace valve stem assembly.
Unable to manually close valve assembly.	Valve assembly not reset before attempting to close.	Reset valve assembly by depressing reset push button (21).
	Sear plate (74) requires adjustment.	Adjust sear plate per "NOTE" following step X of paragraph 7.

TROUBLE SHOOTING CHART
TABLE II

10. Storage Instructions

A. Wrap the altitue opened valve assembly to prevent dust from entering. Do not use any preservative coatings on the valve assembly.

11. Special Tools

A. No special tools are required to overhaul the altitude opened valve assembly.

12. Illustrated Parts List

A. This Illustrated Parts List lists and describes the parts for Altitude Opened Valve Assemblies 10350-3, -5, and -7.

(1) The Group Assembly Parts List consists of a parts listing and a completely indexed drawing. The Altitude Opened Valve Assembly is followed immediately by its component parts, properly indented thereunder, to show their relationship to the assembly.

(2) The quantities listed in the "UNIT PER ASSY" column are, in the case of assemblies, the total quantity used per valve assembly at the location indicated, while the component parts indented under the assemblies are the quantity used per assembly. The quantities specified, therefore,are not necessarily the total used per valve assembly. Refer to the Numerical Index for the total quantities used per altitude opened valve assembly.

(3) The part numbers listed in the "PART NUMBER" column are Scott Aviation Corporation part numbers except standard parts, which are listed by "MS" and "AN" part numbers, and vendor items, which are listed by vendor part numbers. Commercial hardware available at commercial sources is identified by the abbreviation "COML" in the "PART NUMBER" column.

(4) When the length of a part is to be selected as required the abbreviation "AR" will apprear in the "UNITS PER ASSY" column.

(5) A six place code, following the description of a part, indicates the manufacturer of that part. Standard parts and parts carried under Scott part numbers have no vendors' code. The following list contains the codes, and names and addresses of manufacturers supplying items or articles for the valve assembly.

VENDORS' CODE

Code	Name and Address
V00287	Connecticut Engineering and Mfg. Co. Danielson, Conn.
V45681	Parker Hannifin Corp. Cleveland, Ohio
V72962	Elastic Stop Nut Corporation of America Union, N. J.
V79136	Waldes Kohinoor Inc. Long Island City, N. Y.
V93660	Gibson A. C. Co., Inc. Buffalo, New York

(6) Parts used on only one part number valve assembly are indicated by a letter symbol immediately following the description of a part in the "USAGE CODE" column. An explanation of the letter symbols used is outlined below. In cases when the "USAGE CODE" column has been left blank parts listed are common to all altitude opened valve assemblies.

Part Number	Usage Code
10350-3	A
10350-5	B
10350-7	C

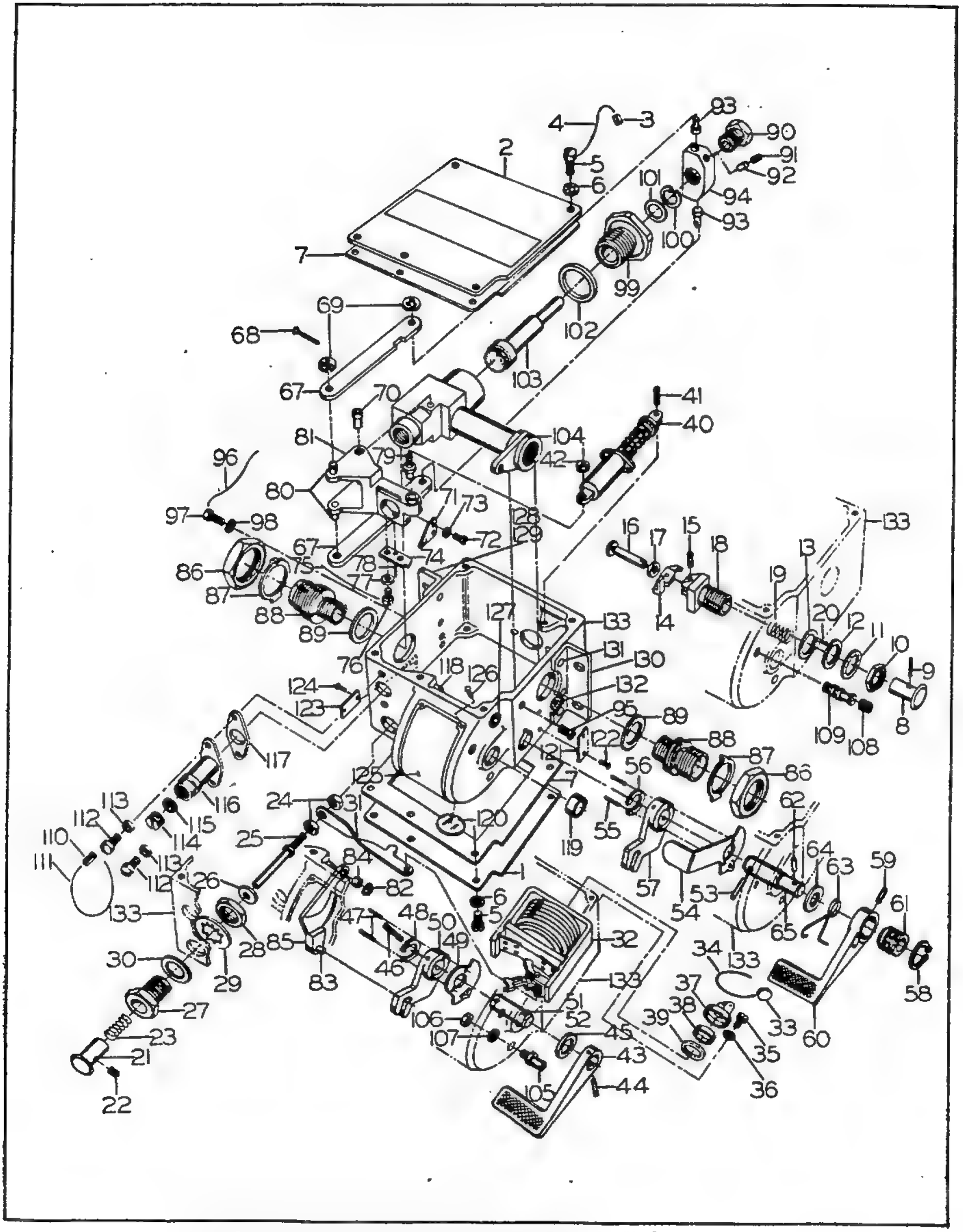
(7) A Numerical Index has been provided at the conclusion of the Group Assembly Parts List. Alpha-numeric arrangement of part numbers has been

assigned in accordance with Specification MIL-B-5005.

B. How to use this Illustrated Parts List

(1) If neither the part number nor the nomenclature is known the part can be found by comparison with the exploded view illustration. When located on the illustration, the index number will refer to the line in the Group Assembly Parts List with the part number and the nomenclature.

(2) When the part number is known, refer to the Numerical Index and find the part number. Opposite the part number is the figure and index number which refers to the Group Assembly Parts List. Proper nomenclature is opposite the index number on the Group Assembly Parts List page.



Altitude Opened Valve Assembly
Figure 12

Fig. & Index No.	Part Number	Nomenclature 1234567	Usage Code	Units Per Assy
	10350-3	Valve Assembly-Altitude opened	A	1
	10350-5	Valve Assembly-Altitude opened	B	1
	10350-7	Valve Assembly-Altitude opened	C	1
-1	10358	.Cover-Bottom		1
-2	10359	.Cover-Nameplate		1
		(ATTACHING PARTS)		
-3	2808	.Seal-Lockwire		2
-4	MS20995C20	.Wire-Lock		AR
-5	AN500A4-4	.Screw-Machine		10
-6	AN936A4	.Washer-Lock		10
		---*---		
-7	23321	.Gasket-Cover		2
-8	23182-1	.Push Button-Press to open	B	1
		(ATTACHING PARTS)		
-9	031-0187MCP	.Pin (V00287)	B	1
		---*---		
-10	AN316C6R	.Nut-Check	B	1
-11	AN936A616	.Washer-Lock	B	1
-12	AN960-616L	.Washer-Flat	B	1
-13	2827-7	.Gasket	B	1
-14	23152	.Lever	B	1
		(ATTACHING PARTS)		
-15	79-012-062-0250	.Pin-Spring (V72962)	B	1
		---*---		
-16	23153	.Slide	B	1
-17	2827-6	.Gasket	B	1
-18	23151-1	.Guide Assembly	B	1
-19	10583	.Spring-Button	B	1
-20	094-0250MBS	.Pin-Spiral (V00287)	B	1
-21	10585	.Push Button-Reset		1
		(ATTACHING PARTS)		
-22	AN565A2H1	.Setscrew		1
		---*---		
-23	10583	.Spring-Button		1
-24	68NTM-40	.Nut (V72962)		2
-25	10582	.Rod-Push		1
-26	10591	.Gasket		1
-27	10581	.Retainer		
		(ATTACHING PARTS)		
-28	AN316C6R	.Nut-Check		1
-29	AN936A616	.Washer-Lock		1
		---*---		

Fig. & Index No.	Part Number	Nomenclature 1234567	Usage Code	Units Per Assy
-30	10590	.Gasket		1
-31	10586	.Lever		1
-32	10501	.Aneroid Assembly	AB	1
	10501-3	.Aneroid Assembly	C	1
		(ATTACHING PARTS)		
-33	9	.Seal-Lockwire (V93660)		1
-34	MS20995C20	.Wire-Lock		AR
-35	AN500AC4-4	.Screw-Machine		2
-36	10380	.Washer-Lock		2
-37	10372	.Cap-Aneroid Assembly		1
-38	10373	.Retainer		1
-39	2800C14A	.Packing-Preformed		1
		---*---		
-40	10563	.Damper Assembly		1
		(ATTACHING PARTS)		
-41	MS171493	.Pin-Spring		1
-42	5133-12-MF	.Ring-Retaining (V79136)		1
		---*---		
-43	10534	.Lever-Hand	AC	1
		(ATTACHING PARTS)		
-44	MS171497	.Pin-Spring	AC	1
		---*---		
-45	10579	.Washer	AC	1
	10364	.Crank Assembly-Control	AC	1
	10365	..Crank Subassembly-Control	AC	1
		(ATTACHING PARTS)		
-46	MS171495	..Pin-Spring	AC	1
		---*---		
-47	10549	...Pin-Locating	AC	2
-48	10569	...Washer-Detent	AC	1
-49	10546	...Cam-Searing	AC	1
-50	10545	...Crank-Control	AC	1
-51	10357	..Shaft-Crank Assembly	AC	1
-52	66-138-2-8	.Packing-Preformed (V45681)		1
	23196-1	.Crank Assembly-Control	B	1
		(ATTACHING PARTS)		
-53	094-0500MBS	.Pin-Spiral (V00287)	B	1
		---*---		
-54	23189-1	.. Indicator	B	1
		(ATTACHING PARTS)		
-55	10549	..Pin-Locating	B	2
		---*---		
-56	10569	..Washer-Detent	B	1
-57	10545-3	..Crank-Control	B	1
	23197-1	.Lever and Shaft Assembly	B	1

Fig. & Index No.	Part Number	Nomenclature 1234567	Usage Code	Units Per Assy
	23192-1	..Lever Assembly-Hand (ATTACHING PARTS)	B	1
-58	5100-43-W	..Ring-Retaining (V79136) ---*---	B	1
-59	094-0250MBS	...Pin-Spiral (V00287)	B	1
-60	23192-3	...Lever-Hand	B	1
-61	23188-1	..Sleeve (ATTACHING PARTS)	B	1
-62	MS16555-4	..Pin-Straight, headless ---*---	B	1
-63	23194-1	..Spring	B	1
-64	23185-1	..Washer	B	1
-65	23190-1	..Shaft	B	1
-66		Deleted		
-67	10532	.Link-Trunnion (ATTACHING PARTS)		2
-68	MS24665-20	.Pin-Cotter		4
-69	10374	.Washer-Flat ---*---		8
	10370	.Lever Assembly-Cocking (ATTACHING PARTS)		1
-70	10571	.Pin-Valve to cocking lever ---*---		2
-71	10568	..Spring-Detent (ATTACHING PARTS)		1
-72	MS35233-1	..Screw-Machine		2
-73	AN935-2L	..Washer-Lock ---*---		2
-74	10529	..Sear Plate (ATTACHING PARTS)		1
-75	MS20995C20	..Wire-Lock		AR
-76	AN500AC4-4	..Screw-Machine		2
-77	AN935-4L	..Washer-Lock		2
-78	MS171432	..Pin-Spring ---*---		1
-79	10530	..Pin-Firing Spring		1
-80	10368	..Pin-Link		2
-81	10528	..Lever-Cocking		1
	10551	.Link Assembly-Bumper (ATTACHING PARTS)		1
-82	5133-12-MF	.Ring-Retaining (V79136) ---*---		1
-83	10570	..Pin-Bumper link		1

Fig. & Index No.	Part Number	Nomenclature 1234567	Usage Code	Units Per Assy
-84	10556	.. Sleeve		1
-85	10538	..Link-Bumper		1
-86	10363	.Nut-Connector		2
-87	10576	.Washer-Lock		2
-88	10355	.Connector	AB	2
	23313-1	.Connector	C	1
	23314-1	.Connector	C	1
-89	10553-2	.Washer		2
-90	10574	.Bushing-Valve stem adjustment		1
		(ATTACHING PARTS)		
-91	AN565F4H3	.Setscrew		1
-92	10573	.Plug-Nylon		1
		---*---		
	10369	.Trunnion Assembly		1
-93	10368-1	..Pin-Link		2
-94	10572	..Trunnion		1
	10513-5	.Valve Assembly-Altitude triggered		1
		(ATTACHING PARTS)		
-95	AN505-4-6	.Screw-Machine		1
-96	MS20995C20	.Wire-Lock		AR
-97	AN500A8-7	.Screw-Machine		2
-98	AN936A8	.Washer-Lock		2
		---*---		
-99	10515	..Cap-Valve		1
-100	MS28782-5	..Retainer		1
-101	2800C10C	..Packing-Preformed		1
-102	10553-1	..Washer		1
-103	10516	..Valve Stem Assembly		1
-104	10514-5	..Body Valve		1
-105	10555	.Stop-Lever	AC	1
		(ATTACHING PARTS)		
-106	AN340C6	.Nut-Plain, hexagon	AC	1
-107	AN936A6	.Washer-Lock	AC	1
		---*---		
-108	23186-1	.Cushion	B	1
		(ATTACHING PARTS)		
-109	23191-1	.Pin-Stop	B	1
		---*---		
	10351	.Connection Assembly-Hose		1
		(ATTACHING PARTS)		
-110	2808	.Seal-Lockwire		1
-111	MS20995C20	.Wire-Lock		AR

Fig. & Index No.	Part Number	Nomenclature 1234567	Usage Code	Units Per Assy
-112	AN500A4-4	.Screw-Machine		2
-113	AN936A4	.Washer-Lock		2
		---*---		
-114	8415-2	..Screw-Slotted head		1
-115	A1119	..Screen-Filter		1
-116	10351-1	..Body-Hose Connection		1
-117	10371	.Gasket		1
	10360-1	.Body Assembly-Automatic Valve	AC	1
	10360-3	.Body Assembly-Automatic Valve	B	1
-118	10542	..Pin-Bumper Link		1
-119	10362	..Bushing	AC	1
	23193-1	..Bushing	B	1
-120	23184-1	..Window	B	1
-121	23183-1	..Plate-Instruction	B	1
		(ATTACHING PARTS)		
-122	AN535-00-2	..Screw-Drive	B	2
		---*---		
-123	10554	..Plate-Identification		1
		(ATTACHING PARTS)		
-124	AN535-00-2	..Screw-Drive		2
		---*---		
-125	10552	..Plate-Instruction	AC	1
	23187-1	..Plate-Instruction	B	1
		(ATTACHING PARTS)		
-126	AN535-00-2	..Screw-Drive		4
		---*---		
-127	AN932-1	..Plug		1
-128	22011-1	..Bracket-Mounting		1
		(ATTACHING PARTS)		
-129	AN470AD4-6	..Rivet		2
		---*---		
-130	10366-2	..Bracket-Mounting		1
		(ATTACHING PARTS)		
-131	AN470AD4-6	..Rivet		3
		---*---		
-132	2800A7B	..Packing-Preformed		1
-133	10361	..Body-Automatic Valve	AC	1
	10361-1	..Body-Automatic Valve	B	1

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AN500A4-4	35	12-5	12
		12-112	
AN500A8-7	35	12-97	2
AN505-4-6	35	12-95	1
AN535-00-2	35	12-122	8
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		12-126	
AN565A2H1	35	12-22	1
AN565F4H3	35	12-91	1
AN932-1	35	12-127	1
AN935-2L	35	12-73	2
AN935-4L	35	12-77	2
AN936A4	35	12-6	12
		12-113	
AN936A6	35	12-107	1
AN936A616	35	12-11	2
		12-29	
AN936A8	35	12-98	2
AN960-616L	35	12-12	1
A1119	35	12-115	1
MS16555-4	35	12-62	1
MS171432	35	12-78	1
MS171493	35	12-41	1
MS171495	35	12-46	1
MS171497	35	12-44	1
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10350-5	35	12-	1
10350-7	35	12-	1
10351	35	12-	1
10351-1	35	12-116	1
10355	35	12-88	2
10357	35	12-51	1
10358	35	12-1	1
10359	35	12-2	1
10360-1	35	12-	1
10360-3	35	12-	1
10361	35	12-133	1
10361-1	35	12-	1
10362	35	12-119	1
10363	35	12-86	2
10364	35	12-	1
10365	35	12-	1
10366-2	35	12-130	2
10368	35	12-80	2
10368-1	35	12-93	2
10369	35	12-	1
10370	35	12-	1
10371	35	12-117	1
10372	35	12-37	1
10373	35	12-38	1
10374	35	12-69	8
10380	35	12-36	2
10501	35	12-32	1
10501-3	35	12-	1
10513-5	35	12-	1
10514-5	35	12-104	1
10515	35	12-99	1
10516	35	12-103	1
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10529	35	12-74	1
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10545-3	35	12-57	1
10546	35	12-49	1
10549	35	12-47	4
		12-55	
10551	35	12-	1
10552	35	12-125	1
10553-1	35	12-102	1
10553-2	35	12-89	2
10554	35	12-123	1
10555	35	12-105	1
10556	35	12-84	1
10563	35	12-40	1
10568	35	12-71	1
10569	35	12-48	2
		12-56	
10570	35	12-83	1
10571	35	12-70	2
10572	35	12-94	1
10573	35	12-92	1
10574	35	12-90	1
10576	35	12-87	2
10579	35	12-45	1
10581	35	12-27	1
10582	35	12-25	1
10583	35	12-19	2
		12-23	
10585	35	12-21	1
10586	35	12-31	1
10590	35	12-30	1
10591	35	12-26	1
22011-1	35	12-128	1
23151-1	35	12-18	1
23152	35	12-14	1
23153	35	12-16	1
23182-1	35	12-8	1
23183-1	35	12-121	1
23184-1	35	12-120	1

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